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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/563,592

01/06/2006

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25944 7590 08/26/2008

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EXAMINER

MAYES, MELVIN C

ART UNIT

PAPER NUMBER

1791

MAIL DATE

DELIVERY MODE

08/26/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/563,592	<b>Applicant(s)</b> TOKUOKA ET AL.	
	<b>Examiner</b> Melvin C. Mayes	<b>Art Unit</b> 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>4/25/06, 12/14/06</u>   | 6) <input type="checkbox"/> Other: _____                          |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

(1)

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

(2)

Claims 12-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 12-15 each claim “by any one of the production methods” however each depends from a single claim. Correction is required.

***Claim Rejections - 35 USC § 102***

(3)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(4)

Claims 1-15 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyazaki et al. 2001/0006451.

Miyazaki et al. disclose a method of making a multilayer ceramic device comprising:  
forming a green sheet by using a green sheet slurry;  
forming an electrode pattern layer on said green sheet;  
forming a dielectric blank pattern layer on level difference gap portion on said electrode pattern layer so as to bury the level difference on said pattern electrode layer by using an electrode level difference absorbing dielectric paste;  
forming a multilayer body by stacking a plurality of stacking units, wherein the stacking unit is said green sheet formed with said dielectric blank pattern layer and said electrode pattern layer; and

firing said multilayer body;  
wherein:  
said green sheet slurry includes a first inorganic dielectric colorant powder and a plasticizer (first organic binder component);  
said electrode level difference absorbing dielectric paste includes a second inorganic dielectric colorant powder and an organic binder (second organic binder component);  
and

wherein the green sheet slurry is comprised of 3 parts by weight plasticizer to 100 parts by weight dielectric powder (weight ratio (A) of 3%) and the dielectric paste is comprised of 10

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parts by weight organic binder to 100 parts by weight dielectric powder (weight ratio (B) of 10%), thus second weight ratio (B) is larger than said first weight ratio (A).

Regarding Claim 2 and 12, the green sheet is made to thickness of 3  $\mu\text{m}$  [0136].

Regarding Claims 3, 8 and 13, the first organic binder component is plasticizer and the second binder component is polyvinyl butyral, cellulose ester, polyacrylate or polyvinyl acrylate, thus the first component and second component are a polymeric resin and a plasticizer.

Regarding Claim 4, the second weight ratio (B) is 10% and the weight ratio of the polymeric resin is 10 wt%.

Regarding Claims 5, 9-11 and 15, the value of (B)-(A) equals 7%, thus within the range of 1.5 or larger.

Regarding Claim 7, the green sheet has thickness of 2  $\mu\text{m}$  after firing [0136].

(5)

Claims 1, 5, 6 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Iwase et al. 6,805,763.

Iwase et al. disclose a method of making a multilayer ceramic device comprising:

forming a green sheet by using a green sheet slurry;

forming an electrode pattern layer on said green sheet;

forming a dielectric blank pattern layer on level difference gap portion on said electrode pattern layer so as to bury the level difference on said pattern electrode layer by using an electrode level difference absorbing dielectric paste;

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forming a multilayer body by stacking a plurality of stacking units, wherein the stacking unit is said green sheet formed with said dielectric blank pattern layer and said electrode pattern layer; and

firing said multilayer body;

wherein:

said green sheet slurry includes a first inorganic dielectric colorant powder and a binder content (first organic binder component);

said electrode level difference absorbing dielectric paste (spacer slurry) includes a second inorganic dielectric colorant powder and a binder content (second organic binder component); and

wherein the green sheet slurry is comprised of 3.5-8 wt% binder content (weight ratio (A)) and the dielectric paste (spacer slurry) is comprised of 6-18 wt% binder content (weight ratio (B)), and the binder content (B) in the slurry for the spacer is higher than the binder content (A) in the slurry for the green sheet (the slurry for the spacer is the slurry as that for the adhesive layer (col. 5, line 25 – col. 7, line 54)).

Regarding Claim 5, the value (B)-(A) can be 6%-3.5% or 18%-8%, thus within the range of 1.5 or larger.

***Claim Rejections - 35 USC § 103***

(6)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

(7)

Claims 3, 4, 10, 11, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwase et al. as applied to claim 1 above, and further in view of JP 2001-261448.

Iwase et al. do not specifically disclose that the green sheet slurry contain a plasticizer.

JP 2001-261448 teaches that slurry for forming a green sheet comprises ceramic powder, resin binder and plasticizer dispersed in a solvent (Abstract).

It would have been obvious to one of ordinary skill at the time of the invention to have provided a plasticizer in the green sheet slurry of Iwase et al., as taught by JP 2001-261448. One of ordinary skill in the art would have known that plasticizer is conventionally used in green sheet slurry to make the formed green sheet more pliable and thus its use in the green sheet slurry of Iwase et al. Because plasticizer is conventionally provided in smaller amounts than the binder resin in the slurry, the content of binder and plasticizer in the green sheet slurry would still obviously be less than the binder content in the slurry for the spacer in the method of Iwase.

Regarding Claims 4 and 14, Iwase et al. disclose that dielectric paste (spacer slurry) is comprised of 6-18 wt% binder content, thus within the claimed ranges of 5-40 wt% weight ratio and 10 wt% or less resin.

Regarding Claims 10, the value (B)-(A) can be 6%-3.5% or 18%-8%, thus within the range of 1.5 or larger.



(8)

Claims 1-15 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Iwaida et al. 2003/0016484.

Iwaida et al. disclose a method of making a laminated ceramic device comprising:

forming a green sheet by using a green sheet slurry;

forming an electrode pattern layer on said green sheet;

forming a dielectric blank pattern layer on level difference gap portion on said electrode pattern layer so as to bury the level difference on said pattern electrode layer by using an electrode level difference absorbing dielectric paste;

forming a multilayer body by stacking a plurality of stacking units, wherein the stacking unit is said green sheet formed with said dielectric blank pattern layer and said electrode pattern layer; and

firing said multilayer body;

wherein:

said green sheet slurry includes a first inorganic dielectric colorant powder and a binder vehicle (first organic binder component);

said electrode level difference absorbing dielectric paste includes a second inorganic dielectric colorant powder and a binder vehicle (second organic binder component); and

wherein the green sheet slurry is comprised of 100 weight parts ceramic component and 55 parts by weight of a vehicle comprising 5.5wt% polyvinyl butyral binder and 1.7wt% plasticizer, and the dielectric paste for the pattern layer is made by pulverizing some of the green

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sheet slurry then adding to 100 parts by weight of the slurry, 55 weight parts of a vehicle comprising 5.5wt% ethyl cellulose binder [0267]-[0285].

Further by making the dielectric paste by adding to the ceramic slurry, which already comprises binder and plasticizer, an additional amount of a vehicle comprising ethyl cellulose binder, the weight ratio (B) of binder component in the dielectric paste is obviously larger than the weight ratio (A) of binder component in the green sheet slurry, as claimed.

Regarding Claims 2, 7 and 12, the green sheet is formed to thickness of 2.5  $\mu\text{m}$  [0268], thus device with interlayer of thickness less than 2.5  $\mu\text{m}$ , as claimed in Claim 7 .

Regarding Claims 3, 8 and 13, each of the green sheet slurry and dielectric paste comprise resin and a plasticizer since the slurry contains plasticizer and the paste is made using some of the slurry.

Regarding Claims 4 and 14, the dielectric paste for the pattern layer is made by pulverizing some of the green sheet slurry then adding to 100 parts by weight of the slurry, 55 weight parts of a vehicle comprising 5.5wt% ethyl cellulose binder, thus weight ratio (B) of binder component within the claimed range and resin of content within the claimed range of 10wt% or less.

Regarding Claims 5, 9-11 and 15, the green sheet slurry is comprised of 100 weight parts ceramic component and 55 parts by weight of a vehicle comprising 5.5wt% polyvinyl butyral binder and 1.7wt% plasticizer and the dielectric paste for the pattern layer is made by pulverizing some of the green sheet slurry then adding to 100 parts by weight of the slurry, 55 weight parts of a vehicle comprising 5.5wt% ethyl cellulose binder, thus a (B)-(A) value within the range of 1.5 or larger, as claimed.

***Conclusion***

(9)

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin C. Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Phillip C. Tucker can be reached on 571-272-1095. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

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like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Melvin C. Mayes  
Primary Examiner  
Art Unit 1791

MCM  
August 19, 2008

/Melvin C. Mayes/  
Primary Examiner, Art Unit 1791